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APPLICATION FOR LETTERS PATENT

**Method and Apparatus for Implementing
Financial Transactions**

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1 **TECHNICAL FIELD**

2 The present invention relates to the handling of financial transactions and,
3 more particularly, to the transfer of funds between accounts at different financial
4 institutions.

5
6 **BACKGROUND**

7 Customers of financial institutions (both individual customers and
8 businesses) typically maintain multiple financial accounts at one or more financial
9 institutions. Financial institutions include, for example, banks, savings and loans,
10 credit unions, mortgage companies, lending companies, and stock brokers. A
11 customer's financial accounts may include asset accounts (such as savings
12 accounts, checking accounts, certificates of deposit (CDs), mutual funds, bonds,
13 and equities) and debt accounts (such as credit card accounts, mortgage accounts,
14 home equity loans, overdraft protection, and other types of loans).

15 In many situations, a user's asset accounts may not be earning the best
16 available interest rate or the user's debt accounts may not be at the most
17 competitive interest rate. It would be to the user's benefit to adjust the funds
18 between different accounts to maximize the interest earned in the asset accounts
19 and/or minimize the interest paid in the debt accounts. For example, a user may
20 have a checking account that pays no interest, but has a high balance. A portion of
21 the funds in the checking account could be transferred to a savings account or
22 other asset account that pays interest on the funds in the account. Similarly, a user
23 with a high credit card balance could save money if a portion of the credit card
24 balance was transferred to a home equity line of credit at a lower interest rate.

1 If a user identifies funds to be transferred between different accounts, the
2 user is then required to execute the necessary transactions. To execute these
3 transactions, the user may need to visit one or more financial institutions and
4 request the appropriate fund transfers. However, if one or more of the financial
5 institutions is located in a distant town, the fund transfers may need to be
6 processed by check or bank wire. Alternately, the user may execute some of the
7 transactions through an online banking service, if the financial institution supports
8 online banking. However, typical online banking services do not permit the
9 transfer of funds between two different financial institutions. Thus, if a user wants
10 to transfer funds, for example, from a checking account at a bank to a money
11 market account at a stock broker, the user cannot generally execute the transfer
12 using online banking.

13 Instead, the user needs to withdraw funds manually using, for example, a
14 check and manually deposit the funds in the second account (either in person or by
15 mail). Since the second account may place a hold on the deposit, the actual fund
16 transfer may not occur for a week (or longer) depending on the amount of the
17 check, the policies of the financial institutions, and any delays involved with
18 mailing the check. A bank wire provides a faster method of transferring funds
19 between financial institutions, but is not generally cost-effective for small transfers
20 (e.g., transfers of less than a few thousand dollars), due to the costs associated with
21 the bank wire. For small transfers, the costs associated with the bank wire may
22 exceed the interest savings generated by the transfer.

23 Furthermore, to execute a particular transaction between two financial
24 institutions that support the online transfer of funds, the user must configure a
25 particular transaction for each possible combination of accounts that may have

1 funds transferred between them. This is tedious and requires the user to remember
2 the differences between the online interfaces at the different financial institutions.

3 If a user's financial institutions support online transfers of funds, before
4 performing any transfers between two financial institutions that support the online
5 transfer of funds, the user must configure a particular transaction for each possible
6 combination of accounts that may have funds transferred between them. This is
7 tedious and requires the user to remember the differences between the online
8 interfaces at the different financial institutions.

9 Thus, the systems and procedures available today do not provide a
10 convenient mechanism for transferring funds between accounts at different
11 financial institutions.

12 The systems and methods described herein addresses these and other
13 problems by allowing a user to transfer funds between accounts at different
14 financial institutions.

17 **SUMMARY**

18 The system and methods described herein initiate a withdrawal of assets
19 from a first account at a first financial institution and initiate a deposit of the
20 withdrawn assets to a second account at a second financial institution. The first
21 account and the second account have a common account holder.

22 Another embodiment analyzes multiple accounts having a common account
23 holder and determines whether an adjustment of funds among the multiple
24 accounts would benefit the account holder. Funds are transferred among the
25 multiple accounts if such a transfer would benefit the account holder.

1 In one embodiment, multiple financial accounts are registered at a single
2 point, thereby allowing the transfer of funds between any pair of registered
3 accounts.

4 5 6 **BRIEF DESCRIPTION OF THE DRAWINGS**

7 Fig. 1 illustrates an exemplary network environment in which various
8 servers, computing devices, and financial management systems exchange data
9 across a network, such as the Internet.

10 Fig. 2 illustrates an example of the interaction between a particular pair of
11 financial institution servers, a market information service, a client computer, and a
12 financial management system.

13 Fig. 3 is a block diagram showing pertinent components of a computer in
14 accordance with the invention.

15 Fig. 4 is a block diagram showing exemplary components and modules of a
16 financial management system.

17 Fig. 5 is a block diagram showing exemplary components and modules of
18 an asset analysis and recommendation module.

19 Fig. 6 is a block diagram showing exemplary components and modules of a
20 debt analysis and recommendation module.

21 Fig. 7 is a block diagram showing exemplary components and modules of a
22 balance sheet analysis and recommendation module.

23 Fig. 8 is a flow diagram illustrating a procedure for identifying financial
24 transactions to optimize a user's asset account balances.
25

1 Fig. 9 is a flow diagram illustrating a procedure for identifying financial
2 transactions to optimize a user's debt account balances.

3 Fig. 10 is a flow diagram illustrating a procedure for identifying financial
4 transactions to optimize a user's balance sheet.

5 Fig. 11 is a flow diagram illustrating a procedure for automatically
6 optimizing a user's asset accounts, debt accounts, and balance sheet.

7 Fig. 12 is a table illustrating various information associated with different
8 financial institutions.

9 Fig. 13 is a table illustrating various customer information related to
10 financial accounts and user preferences.

11 Figs. 14-15 illustrate exemplary user interface screens illustrating various
12 account entry fields and account recommendations.

13 Fig. 16 illustrates an exemplary environment in which funds are transferred
14 between various financial institutions using a payment network.

15 Fig. 17 is a flow diagram illustrating a procedure for transferring funds
16 between two financial institutions.

17 Fig. 18 illustrates another exemplary environment in which funds are
18 transferred between various financial institutions using multiple payment
19 networks.

20 Fig. 19 illustrates another environment in which funds are transferred
21 between various financial institutions.

DETAILED DESCRIPTION

The system and methods described herein automatically analyze multiple financial accounts to determine whether the account balances are optimized based on the best available interest rates, the interest rates associated with the multiple financial accounts, and the balances of the multiple financial accounts. After analyzing the accounts, recommendations are provided, if necessary, for adjusting account funds to allow the account holder to earn greater interest in asset accounts and/or pay less interest in debt accounts. If authorized by the user, fund transfers are initiated to automatically execute the recommended fund adjustments. The systems and methods described herein may operate in a proactive manner, such that the various recommendations are generated without any action or request by the user. The financial management system described herein may regularly analyze a user's accounts and make recommendations, if appropriate, on its own initiative, without any prompting from the user.

As used herein, the terms "account holder", "customer", "user", and "client" are interchangeable. "Account holder" refers to any person having access to an account. A particular account may have multiple account holders (e.g., a joint checking account having husband and wife as account holders or a corporate account identifying several corporate employees as account holders. Various financial account and financial institution examples are provided herein for purposes of explanation. However, it will be appreciated that the system and procedures described herein can be used with any type of asset account and any type of debt account. Example asset accounts include savings accounts, money market accounts, checking accounts (both interest-bearing and non-interest-bearing), certificates of deposit (CDs), mutual funds, bonds, and equities.

1 Example debt accounts include credit card accounts, mortgage accounts, home
2 equity loans, overdraft protection, margin accounts, personal loans, and other
3 types of loans. Exemplary financial institutions include banks, savings and loans,
4 credit unions, mortgage companies, mutual fund companies, lending companies,
5 and stock brokers.

6 Various attributes associated with an asset account and/or a debt account
7 are discussed herein. These attributes are used to analyze various accounts and
8 make recommendations that would benefit the account holder. Example attributes
9 include interest rate, loan repayment terms, minimum balance, type of collateral,
10 etc. Although particular examples are discussed herein with reference to interest
11 rates, it will be appreciated that the methods and systems described herein are
12 applicable to any type of attribute.

13 Fig. 1 illustrates an exemplary network environment 100 in which various
14 servers, computing devices, and financial management systems exchange data
15 across a data communication network. The network environment of Fig. 1
16 includes multiple financial institution servers 102, 104, and 106 coupled to a data
17 communication network 108, such as the Internet. A market information service
18 server 110 and a financial management system 118 are also coupled to network
19 108. Additionally, a wireless device 112 and a client computer 114 are coupled to
20 network 108. Wireless device 112 may be a personal digital assistant (PDA), a
21 handheld or portable computer, a cellular phone, a pager, or any other device
22 capable of communicating with other devices via a wireless connection. A
23 financial information provider 116 is coupled between network 108 and client
24 computer 114.

Network 108 may be any type of data communication network using any communication protocol. Further, network 108 may include one or more sub-networks (not shown) which are interconnected with one another.

The communication links shown between the network 108 and the various devices (102-106 and 110-118) shown in Fig. 1 can use any type of communication medium and any communication protocol. For example, one or more of the communication links shown in Fig. 1 may be a wireless link (e.g., a radio frequency (RF) link or a microwave link) or a wired link accessed via a public telephone system or another communication network. Wireless device 112 typically accesses network 108 via a wireless connection to another communication network that is coupled to network 108. Certain devices, such as servers, may be coupled to a local area network (LAN), which is coupled to network 108. Client computer 114 may access network 108 in different ways. First, client computer 114 may directly access network 108, for example, by using a modem to access a public telephone network (e.g., a public switched telephone network (PSTN)) that is coupled to network 108. Alternately, client computer 114 may access financial information provider 116, which establishes a connection to network 108. Financial information provider 116 may act as a “buffer” between network 108 and client computer 114, or may allow commands and data to simply pass-through between the network 108 and the client computer 114.

Each of the financial institution servers 102, 104, and 106 are typically associated with a particular financial institution and store data for that financial institution, such as customer account data. The market information service server 110 may represent one or more services that collect and report information regarding current financial market conditions. For example, a particular market

1 information service may collect information from many financial institutions to
2 generate a report identifying the average interest rates for savings, checking, or
3 other accounts. The report may also identify the highest rates for each type of
4 account and the financial institution offering those rates. Multiple market
5 information service servers 110 may be coupled to network 108, each server
6 providing a different type of market data.

7 Financial management system 118 performs various account analysis
8 functions to determine whether a user's financial accounts (e.g., both asset
9 accounts and debt accounts) are optimized. Additionally, financial management
10 system 118 is capable of initiating the automatic transfer of funds between
11 accounts at one or more financial institutions. These analysis and fund transfer
12 functions are discussed in greater detail below. Wireless device 112 and client
13 computer 114 allow a user to access information via the network 108. For
14 example, the user can access account information from one of the financial
15 institution servers 102, 104, or 106, access current interest rate data from market
16 information service server 110, or send a request for an analysis of the user's
17 financial accounts to financial management system 118. Financial information
18 provider 116 acts as an intermediary between client computer 114 and other
19 devices coupled to network 108. For example, client computer 114 generates a
20 request for data or account analysis and communicates the request to the financial
21 information provider 116. The financial information provider 116 then retrieves
22 the requested data or initiates the requested account analysis on behalf of the user
23 of client computer 114.

24 Fig. 2 illustrates an example of the interaction between a particular pair of
25 financial institution servers 132 and 134, a market information service server 140,

1 a client computer 136, and a financial management system 138. In this example,
2 each financial institution server 132 and 134 is associated with a different financial
3 institution. Client computer 136 is capable of accessing financial institution server
4 132 via a communication link 142 and accessing financial institution server 134
5 via a communication link 144. For example, the user of client computer 136 may
6 retrieve account information or interest rate information from one or both of the
7 financial institution servers 132, 134. Client computer 136 is also capable of
8 interacting with financial management system 138 via a communication link 146.
9 The user of client computer 136 may access financial management system 138, for
10 example, to have the system analyze the user's financial accounts and
11 automatically initiate the transfer of funds between accounts.

12 Financial management system 138 is coupled to the two financial
13 institution servers 132 and 134 via two communication links 148 and 150,
14 respectively. Communication links 148 and 150 allow the financial management
15 system 138 to retrieve information from the financial institution servers 132, 134,
16 and execute transactions on the financial institution servers on behalf of the user of
17 client computer 136. Financial management system 138 is also coupled to market
18 information service server 140 through a communication link 152, which allows
19 the financial management system to retrieve various information regarding market
20 interest rates and other market data. Financial institution servers 132 and 134 are
21 capable of communicating with one another via a communication link 154, which
22 allows the servers to exchange data and other information with one another.

23 Communication links 142-154 may be dial-up connections and/or
24 connections via one or more networks of the type discussed above with respect to
25 Fig. 1.

Fig. 3 is a block diagram showing pertinent components of a computer 180 in accordance with the invention. A computer such as that shown in Fig. 3 can be used, for example, to perform various financial analysis operations such as accessing and analyzing a user's financial account information to make account recommendations. Computer 180 can also be used to access a web site or other computing facility to access the various financial analysis functions. The computer shown in Fig. 3 can function as a server, a client computer, or a financial management system, of the types discussed herein.

Computer 180 includes at least one processor 182 coupled to a bus 184 that couples together various system components. Bus 184 represents one or more of any of several types of bus structures, such as a memory bus or memory controller, a peripheral bus, and a processor or local bus using any of a variety of bus architectures. A random access memory (RAM) 186 and a read only memory (ROM) 188 are coupled to bus 184. Additionally, a network interface 190 and a removable storage device 192, such as a floppy disk or a CD-ROM, are coupled to bus 184. Network interface 190 provides an interface to a data communication network such as a local area network (LAN) or a wide area network (WAN) for exchanging data with other computers and devices. A disk storage 194, such as a hard disk, is coupled to bus 184 and provides for the non-volatile storage of data (e.g., computer-readable instructions, data structures, program modules and other data used by computer 180). Although computer 180 illustrates a removable storage 192 and a disk storage 194, it will be appreciated that other types of computer-readable media which can store data that is accessible by a computer, such as magnetic cassettes, flash memory cards, digital video disks, and the like, may also be used in the exemplary computer.

1 Various peripheral interfaces 196 are coupled to bus 184 and provide an
2 interface between the computer 180 and the individual peripheral devices.
3 Exemplary peripheral devices include a display device 198, a keyboard 200, a
4 mouse 202, a modem 204, and a printer 206. Modem 204 can be used to access
5 other computer systems and devices directly or by connecting to a data
6 communication network such as the Internet.

7 A variety of program modules can be stored on the disk storage 194,
8 removable storage 192, RAM 186, or ROM 188, including an operating system,
9 one or more application programs, and other program modules and program data.
10 A user can enter commands and other information into computer 180 using the
11 keyboard 200, mouse 202, or other input devices (not shown). Other input devices
12 may include a microphone, joystick, game pad, scanner, satellite dish, or the like.

13 Computer 180 may operate in a network environment using logical
14 connections to other remote computers. The remote computers may be personal
15 computers, servers, routers, or peer devices. In a networked environment, some or
16 all of the program modules executed by computer 180 may be retrieved from
17 another computing device coupled to the network.

18 Typically, the computer 180 is programmed using instructions stored at
19 different times in the various computer-readable media of the computer. Programs
20 and operating systems are often distributed, for example, on floppy disks or CD-
21 ROMs. The programs are installed from the distribution media into a storage
22 device within the computer 180. When a program is executed, the program is at
23 least partially loaded into the computer's primary electronic memory. As
24 described herein, the invention includes these and other types of computer-
25 readable media when the media contains instructions or programs for

1 implementing the steps described below in conjunction with a processor. The
2 invention also includes the computer itself when programmed according to the
3 procedures and techniques described herein.

4 For purposes of illustration, programs and other executable program
5 components are illustrated herein as discrete blocks, although it is understood that
6 such programs and components reside at various times in different storage
7 components of the computer, and are executed by the computer's processor.
8 Alternatively, the systems and procedures described herein can be implemented in
9 hardware or a combination of hardware, software, and/or firmware. For example,
10 one or more application specific integrated circuits (ASICs) can be programmed to
11 carry out the systems and procedures described herein.

12 Fig. 4 is a block diagram showing exemplary components and modules of a
13 financial management system 220. A communication interface 222 allows the
14 financial management system 220 to communicate with other computing systems,
15 such as servers, client computers, and portable computing devices. In one
16 embodiment, communication interface 222 is a network interface to a LAN, which
17 is coupled to another data communication network, such as the Internet.

18 The financial management system 220 stores customer data 224, such as
19 customer account information, online banking login name and password, and user
20 preferences. Financial management system 220 also stores financial institution
21 data 226 and market information 228. Financial institution data 226 includes, for
22 example, transaction routing data, account offerings, account interest rates, and
23 minimum account balances. Market information 228 includes data such as
24 average interest rates for different types of accounts (both asset accounts and debt
25

1 accounts), the best available interest rates for each type of account, and the
2 financial institutions offering the best available interest rates.

3 An asset analysis and recommendation module 230 analyzes various asset
4 accounts to determine whether the accounts are earning the best available interest
5 rates (or close to the best interest rates) and whether the fund allocation among the
6 asset accounts is optimal or close to optimal. If fund adjustments would benefit
7 the account holder, then module 230 makes the appropriate recommendations to
8 the account holder. The asset accounts analyzed may be associated with two or
9 more different financial institutions. A debt analysis and recommendation module
10 232 analyzes various debt accounts to determine whether the accounts are paying
11 the most competitive (i.e., the lowest) interest rates or close to the best interest
12 rates. Module 232 also determines whether the allocation of funds among the debt
13 accounts is optimal or close to optimal, and makes recommendations, if necessary,
14 to adjust funds in a manner that reduces the overall interest payments. The debt
15 accounts analyzed may be associated with two or more different financial
16 institutions.

17 A balance sheet analysis and recommendation module 234 analyzes both
18 asset accounts and debt accounts to determine whether the allocation of funds
19 among all of the accounts is optimal or close to optimal. If fund adjustments
20 would benefit the account holder, then the balance sheet analysis and
21 recommendation module 234 makes the appropriate recommendations to the
22 account holder.

23 A report generator 236 generates various types of reports, such as account
24 activity history, current recommendations to adjust funds among accounts, or a
25 report comparing the current market interest rates to the interest rates of a user's

1 current accounts. A transaction execution module 238 executes financial
2 transactions on behalf of account holders. For example, an account holder may
3 request that the financial management system 220 execute the recommendations
4 generated by one or more of the three analysis and recommendation modules 230,
5 232, and 234. In this example, transaction execution module 238 identifies the
6 recommendations and executes the financial transactions necessary to implement
7 the recommendations. An account verification module 240 verifies that the user
8 accessing financial management system 220 is authorized to access a particular
9 account.

10 Fig. 5 is a block diagram showing exemplary components and modules of
11 asset analysis and recommendation module 230. An asset account information
12 collection module 250 collects information about a user's asset accounts. When a
13 user accesses the financial management system and requests an analysis of the
14 user's asset accounts, the system prompts the user to enter account information for
15 all of the user's asset accounts. The information provided for each account may
16 include the name of the financial institution, the account number, and the login
17 name and password for online access to the account. This information is typically
18 stored by the financial management system to avoid asking the user to re-enter the
19 same information in the future. Based on the information provided by the user, the
20 asset account information collection module 250 is able to access the user's
21 accounts and determine the balance of each account as well as other information
22 such as the interest rate and minimum balance for the account.

23 After collecting the user's asset account information, the collection module
24 250 organizes the account information into a common format and communicates
25

1 the information to an asset analysis and recommendation engine 254 for
2 processing.

3 A financial institution and market data collection module 256 collects
4 information about particular financial institutions (e.g., transaction routing
5 information and account offerings) and information about current market interest
6 rates. The information about financial institutions may be retrieved from the
7 financial institutions themselves or from one or more market information services
8 that provide information about various financial institutions. The information
9 relating to current market interest rates is collected from one or more market
10 information services. After collecting the financial institution information and the
11 market data, the collection module 256 communicates the collected information
12 and data to the asset analysis and recommendation engine 254.

13 A default asset analysis logic 258 defines a default set of logic rules used to
14 analyze a user's asset accounts. These default logic rules are used if the user does
15 not create their own set of logic rules and does not select from one of several sets
16 of alternate asset analysis logic rules 260 and 262. The alternate logic rules 260
17 and 262 may provide different approaches to asset account analysis (e.g., a
18 conservative approach, a moderate approach, or an aggressive approach). In
19 particular embodiments, at least one of the alternate logic rules 260, 262 is
20 associated with a financial and/or investment celebrity, who defines the particular
21 set of logic rules based on their financial and/or investment expertise.

22 The particular logic rules selected for each user may be different based on
23 the sets of logic rules chosen by the user. Additionally, the logic rules selected for
24 a particular user may change over time as the financial management system learns
25 more about the user's payment or spending habits. For example, if the user

1 regularly makes a \$1000 payment from a particular checking account on the 15th
2 of each month, a rule may be created by the financial management system to
3 ensure that the checking account has at least a \$1000 balance on the 14th of each
4 month. If the checking account does not have a sufficient balance, then the
5 financial management system may recommend a fund transfer to raise the balance
6 of the checking account to cover the anticipated \$1000 payment on the 15th. This
7 type of user-specific logic rule may be stored with the other user data in the
8 financial management system.

9 Asset analysis and recommendation engine 254 analyzes the user's asset
10 account information by applying the various asset analysis logic rules to the asset
11 account information. The asset analysis and recommendation engine 254 also
12 considers market data collected by collection module 256 when analyzing the
13 user's asset accounts. After analyzing the user's asset accounts, the asset analysis
14 and recommendation engine 254 generates one or more recommendations to adjust
15 the fund allocation among the asset accounts. The recommendation may also
16 include opening a new asset account (e.g., an account that pays a higher interest
17 rate) and/or closing an existing asset account (e.g., an account that pays a low
18 interest rate). The recommendations and analysis results are output on
19 communication link 264 for use by other modules or components in the financial
20 management system.

21 Fig. 6 is a block diagram showing exemplary components and modules of
22 debt analysis and recommendation module 232. A debt account information
23 collection module 270 collects information about a user's debt accounts. When a
24 user accesses the financial management system and requests an analysis of the
25 user's debt accounts, the system prompts the user to enter account information for

each of the user's debt accounts. The information provided for each account may include the name of the financial institution, the account number, and information necessary to access the account online. This information is typically stored by the financial management system to avoid asking the user to re-enter the same information in the future. Based on the information provided by the user, the debt account collection module 270 accesses the user's debt accounts and determines the balance of each account as well as other information, such as the interest charged and the maximum balance for the account.

After collecting the user's debt account information, the collection module 270 organizes the account information into a common format and communicates the account information to a debt analysis and recommendation engine 274 for processing.

A financial institution and market data collection 276 collects information regarding particular financial institutions and information about current market interest rates. The information relating to financial institutions may be retrieved from the financial institutions themselves or from one or more market information services that provide information about various financial institutions. The information relating to current market interest rates is collected from one or more market information services. After collecting the financial institution information and the market data, the collection module 276 communicates the collected information and data to the debt analysis and recommendation engine 274.

A default debt analysis logic 278 defines a default set of logic rules used to analyze a user's debt accounts. These default logic rules are used if the user does not create their own set of logic rules and does not select from one of the several sets of alternate debt analysis logic 280 and 282. The alternate logic rules 280 and

282 may provide different approaches to debt account analysis, such as a conservative approach, a moderate approach, or an aggressive approach. In a particular embodiment, at least one of the alternate logic rules 280, 282 is associated with a financial and/or investment celebrity, who defines the particular set of logic rules based on their financial and/or investment expertise.

The particular logic rules selected for each user may be different based on the sets of logic rules chosen by the user. Additionally, the logic rules selected for a particular user may change over time as the financial management system learns more about the user's payment or spending habits. For example, if the user has too many expenses (i.e., the current month's expenses exceed the user's typical monthly income), then the logic rules (applied by the analysis engine) may suggest a short term loan to cover the expenses, thereby avoiding a situation in which the user has insufficient funds to pay bills as they become due. Additionally, if the loan will only be required for a short period of time, the rules may suggest opening (or taking advantage of an existing) overdraft protection account.

Different debt logic rules may be applied depending on a user's opinions regarding debt. One user might use the majority of available assets to pay down debts, thereby minimizing the user's level of debt. Another user might want to maintain a larger "cushion" of cash and only pay down debts if the available assets exceed a predetermined amount (e.g., \$10,000). Debt rules from, for example, a celebrity or well-known financial analyst might recommend setting aside savings at the beginning of the month to "force" the appropriate monthly savings. The remainder of the assets are then used to pay monthly bills and other expenses. Other financial analysts may use different sets of logic rules to define the analysis and handling of asset accounts and debt accounts.

Debt analysis and recommendation engine 274 analyzes the user's debt account information by applying the various debt analysis logic rules to the debt account information. The debt analysis and recommendation engine 274 also considers market data collected by collection module 276 when analyzing the user's debt accounts. After analyzing the user's debt accounts, the debt analysis and recommendation engine 274 generates one or more recommendations to adjust the fund allocation among the debt accounts. The recommendation may also include opening a new debt account (e.g., an account with a lower interest rate) and/or closing an existing debt account (e.g., an account with a high interest rate). The recommendations and analysis results are output on communication link 284 for use by other modules or components in the financial management system.

Fig. 7 is a block diagram showing exemplary components and modules of balance sheet analysis and recommendation module 234. An account information collection module 290 collects information about a user's asset accounts and debt accounts. When a user accesses the financial management system and requests an analysis of the user's balance sheet, the system prompts the user to enter account information for each of the user's asset accounts and debt accounts. The information provided for each account may include the name of the financial institution, the account number, and information necessary to access the account online. This information is typically stored by the financial management system to avoid asking the user to re-enter the same information in the future. Based on the information provided by the user, the account collection module 290 accesses the user's debt accounts and determines the balance of each account as well as other information, such as the interest charged or earned, and the maximum balance or credit limit associated with the account.

After collecting the user's asset and debt account information, the collection module 290 organizes the account information into a common format and communicates the account information to a balance sheet analysis and recommendation engine 294 for processing.

A financial institution and market data collection 296 collects information regarding particular financial institutions and information about current market interest rates for both asset accounts and debt accounts. The information relating to financial institutions may be retrieved from the financial institutions themselves or from one or more market information services that provide information about various financial institutions. The information relating to current market interest rates is collected from one or more market information services. After collecting the financial institution information and the market data, the collection module 296 communicates the collected information and data to the balance sheet analysis and recommendation engine 294.

A default balance sheet analysis logic 298 defines a default set of logic rules used to analyze a user's balance sheet. These default logic rules are used if the user does not create their own set of logic rules and does not select from one of the several sets of alternate balance sheet analysis logic 300 and 302. The alternate logic rules 300 and 302 may provide different approaches to debt account analysis, such as a conservative approach, a moderate approach, or an aggressive approach. In a particular embodiment, at least one of the alternate logic rules 300, 302 is associated with a financial and/or investment celebrity, who defines the particular set of logic rules based on their financial and/or investment expertise.

The particular logic rules selected for each user may be different based on the sets of logic rules chosen by the user. Additionally, the logic rules selected for

Different balance sheet logic rules may be applied depending on a user's opinions regarding assets and debts. One user might prefer to use the majority of available assets to pay down debts, thereby minimizing the user's level of debt. Another user might want to maintain a larger "cushion" of cash and only pay down debts if the available assets exceed a predetermined amount (e.g., \$5,000).

Balance sheet analysis and recommendation engine 294 analyzes the user's balance sheet information by applying the various balance sheet analysis logic rules to the balance sheet information. The balance sheet analysis and recommendation engine 294 also considers financial institution and market data collected by collection module 296 when analyzing the user's balance sheet. After analyzing the user's balance sheet, the balance sheet analysis and recommendation engine 294 generates one or more recommendations to adjust the fund allocation among the user's asset accounts and debt accounts. The recommendation may also include opening one or more new accounts and/or closing one or more existing accounts. The recommendations and analysis results are output on communication link 304 for use by other modules or components in the financial management system.

Fig. 8 is a flow diagram illustrating a procedure for identifying financial transactions to optimize a user's asset account balances. The procedure begins by

analyzing the user's asset accounts (block 320). The procedure then determines the best available asset accounts (block 322), for example, by using market interest rate information from a market information service. Next, the procedure determines whether there are better accounts for the user's assets (block 324). These "better" accounts may include asset accounts that earn higher interest rates than the user's current asset accounts.

If the procedure identifies better accounts for the user's assets, then the procedure selects the best alternative account (or accounts) and makes a recommendation that the user open the alternative account (block 326). If the procedure does not identify any better accounts for the user's assets, then the procedure continues to block 328, where the procedure determines whether the assets in the user's accounts should be adjusted. If the user's asset accounts should be adjusted, then the procedure identifies the best adjustment of the user's asset accounts and makes asset adjustment recommendations to the user (block 330). Finally, the user is provided the opportunity to automatically execute any of the recommendations, such as opening one or more new asset accounts and/or moving funds between asset accounts (block 332). If the user chooses to have the recommendations executed automatically, the financial management system executes the necessary financial transactions to implement the system's recommendations as discussed in greater detail below. The procedure described above with respect to Fig. 8 may be implemented, for example, by asset analysis and recommendation module 230.

Fig. 9 is a flow diagram illustrating a procedure for identifying financial transactions to optimize a user's debt account balances. The procedure analyzes the user's debt accounts (block 350) and determines the best available debt

1 accounts (block 352). The best available debt accounts are determined, for
2 example, by using market interest rate information from one or more market
3 information services. Next, the procedure determines whether there are better
4 accounts for the user's debts (block 354). These "better" accounts may include
5 debt accounts that charge lower interest rates than the user's current debt accounts.

6 If better accounts are identified for the user's debts, then the procedure
7 selects the best alternative account (or accounts) and makes a recommendation
8 that the user open the alternative account (block 356). If the procedure does not
9 identify any better accounts for the user's debts, then the procedure continues to
10 block 358, to determine whether the debts in the user's accounts should be
11 adjusted. If the user's debt accounts should be adjusted, then the procedure
12 identifies the best adjustment of the user's debt accounts and makes asset
13 adjustment recommendations to the user (block 360). Finally, the user is provided
14 the opportunity to automatically execute any of the recommendations, such as
15 opening one or more new debt accounts and/or moving funds between debt
16 accounts (block 362). If the user chooses to have the recommendations executed
17 automatically, the financial management system executes the necessary financial
18 transactions to implement the system's recommendations, as discussed below. The
19 procedure described above with respect to Fig. 9 can be implemented, for
20 example, by debt analysis and recommendation module 232.

21 Fig. 10 is a flow diagram illustrating a procedure for identifying financial
22 transactions to optimize a user's balance sheet. The procedure analyzes the user's
23 balance sheet (block 370) and determines whether there is a better distribution of
24 assets and debts across the user's balance sheet (block 372). For example, a
25 "better distribution" of assets and debts may result in greater interest earned by the

1 user or less interest paid by the user. If there is a better distribution of assets and
2 debts across the user's balance sheet, then the procedure identifies the optimal
3 allocation of assets and debts and makes recommendations to the user (block 374).

4 If the procedure does not identify any better distribution of assets and debts,
5 then the procedure continues to block 376, to determine whether the amounts in
6 the user's asset and debt accounts should be adjusted. If the user's accounts
7 should be adjusted, then the procedure identifies the best adjustment of the user's
8 asset and debt accounts and makes adjustment recommendations to the user (block
9 378). Finally, the user is provided the opportunity to automatically execute any of
10 the recommendations (block 380), such as moving funds between accounts to
11 maximize interest earned or minimize interest paid. If the user chooses to have the
12 recommendations executed automatically, the financial management system
13 executes the necessary financial transactions to implement the system's
14 recommendations. The procedure described above with respect to Fig. 10 can be
15 implemented, for example, by balance sheet analysis and recommendation module
16 234.

17 A user may choose to have the financial management system 220 (Fig. 4)
18 analyze and make recommendations regarding the user's asset accounts, while
19 ignoring the user's debt accounts. Fig. 8 illustrates an example procedure for this
20 type of analysis and recommendation. Additionally, the user may select specific
21 asset accounts to ignore during the analysis procedure. For example, the user may
22 have a savings account for a special purpose. Even though the savings account
23 may earn a below-average interest rate, the user does not want funds transferred
24 into or out of that savings account. In this example, the user would instruct the
25 financial management system to ignore that particular savings account.

1 The user may also choose to have the financial management system analyze
2 and make recommendations regarding the user's debt accounts, while ignoring the
3 user's asset accounts. Fig. 9 illustrates an example procedure for this type of
4 analysis and recommendation. Additionally, the user may select specific debt
5 accounts to ignore during the analysis procedure. For example, the user may want
6 to pay-off and close a particular debt account even though the account has a
7 favorable interest rate. In this example, the user would instruct the financial
8 management system to ignore that particular debt account when performing its
9 analysis.

10 The user can also choose to have the financial management system analyze
11 and make recommendations regarding both the user's asset accounts and debt
12 accounts (i.e., analyze the user's balance sheet). Fig. 10 illustrates an example
13 procedure for this type of analysis and recommendation. Additionally, the user
14 may select one or more asset accounts or debt accounts to ignore during the
15 analysis procedure. Thus, the user has the option of selecting the types of
16 accounts to consider, as well as specific accounts to consider or ignore, when the
17 financial management system performs its analysis and makes recommendations.

18 Fig. 11 is a flow diagram illustrating a procedure for automatically
19 optimizing a user's asset accounts, debt accounts, and balance sheet. Initially, the
20 procedure determines the best adjustment of the user's asset accounts (block 400).
21 The best adjustment of the user's asset accounts may include opening a new
22 account, closing an existing account, and/or transferring funds between accounts
23 (new accounts or existing accounts). If the user's asset accounts are already
24 optimized, or almost optimized, the procedure determines that no adjustment of
25 asset accounts is necessary.

1 Next, the procedure determines the best adjustment of the user's debt
2 accounts (block 402) and the best adjustment of the user's balance sheet (block
3 404). The best adjustment of the user's debt accounts and the user's balance sheet
4 may include opening one or more new accounts, closing one or more existing
5 accounts, and/or transferring funds between accounts (new accounts or existing
6 accounts). If the user's debt accounts are already optimized, or almost optimized,
7 the procedure determines that no adjustment of debt accounts is necessary.
8 Similarly, if the user's balance sheet is already optimized, or almost optimized,
9 then the procedure determines that no adjustment of asset accounts or debt
10 accounts is necessary.

11 The various logic rules discussed above, which are used by the financial
12 management system to determine whether funds should be adjusted between
13 accounts, may define how to determine whether accounts are "almost optimized."
14 Typical factors that may be considered in determining whether accounts are
15 "almost optimized" include: the savings (extra interest earned or less interest
16 paid) that would result from an adjustment of funds, the difference in interest rates,
17 the time required to implement the adjustment of funds, fees associated with the
18 adjustment of funds, and the "risk" associated with the adjustment. The "risk"
19 may be overdrawing an account by leaving insufficient funds to cover unexpected
20 expenses (or expenses that are greater than expected).

21 For example, if a particular adjustment of funds would result in an increase
22 in interest earnings of three cents per week, most logic rules will consider this
23 situation "almost optimized." In this situation, the financial management system
24 will not recommend the adjustment of funds because the additional interest is
25 insignificant.

After the procedure has determined the best adjustment of the user's accounts (blocks 400, 402, and 404), the procedure identifies the financial institutions involved in the adjustment of the user's accounts (block 406). The financial institutions are determined from the information entered by the user when identifying the user's accounts to the financial management system. Next, the procedure contacts the appropriate financial institutions and/or payment networks and executes the financial transfers necessary to implement the recommended adjustments to the user's accounts (block 408). A payment network may be, for example, the Federal Automated Clearing House (ACH), a debit network, a credit network, the federal wire system, or an ATM network. The financial management system is able to automatically access the user's accounts by using the login name and password for the account, which is provided by the user when identifying the user's accounts to the financial management system.

After executing the financial transactions necessary to implement the recommended adjustments to the user's accounts, the a report is generated for the user that identifies the financial transfers executed (block 410). Finally, the user's account information is updated in the financial management system such that the system has accurate account balance information for all of the user's accounts (block 412).

The procedure described above with respect to Fig. 11 can be modified based on the user's preferences with respect to the types of accounts to be analyzed. For example, if the user selects only asset accounts for analysis, then the functions associated with blocks 402 and 404 of the procedure are not performed.

1 Fig. 12 shows a table 430 illustrating various information associated with
2 different financial institutions. The information contained in table 430 may be
3 obtained from the financial institution itself or from one or more market
4 information services. The information contained in table 430 is periodically
5 updated by comparing the information stored in the table against the current
6 financial institution information.

7 The first column of table 430 identifies the name of the financial institution
8 and the second column identifies the American Banking Association (ABA)
9 number and routing number. The third column indicates an Internet uniform
10 resource locator (URL) associated with the financial institution. The fourth
11 column of table 430 identifies the various account offerings from a particular
12 financial institution. In this example, Bank of America offers a savings account,
13 two types of checking accounts (interest bearing and non-interest bearing), a three
14 month certificate of deposit (CD), a home equity loan, a credit card account, and
15 overdraft protection for a checking account. The next column indicates the type of
16 account (e.g., an asset account or a debt account).

17 The sixth column of table 430 indicates the current interest rate associated
18 with each account. In the case of an asset account, the interest rate is the interest
19 paid to a customer based on the balance in the account. In the case of a debt
20 account, the interest rate is the interest charged to a customer based on the
21 outstanding balance of the debt. The last column in table 430 indicates the
22 minimum balance associated with each account. In this example, the debt
23 accounts do not have a minimum balance. However, a debt account may have a
24 maximum balance (e.g., the maximum value that can be loaned). Although not
25 shown in Fig. 12, additional account information may be stored in table 430, such

as monthly service charges, per-check charges, service charges for ATM transactions, or service charges if the minimum balance is not maintained.

Fig. 13 shows a table 440 illustrating various customer information related to financial accounts and user preferences. Most information contained in table 440 is obtained from the user during an account setup procedure. The current account balance information is typically retrieved from the financial institution by the financial management system. The account balance information is periodically updated by retrieving current information from the financial institution.

The first column of table 440 identifies the customer name (the table contains customer information for multiple customers accessing the same financial management system). The second column identifies a financial institution and the third column identifies an account number as well as an online username and password associated with the account number. The username and password are used to access the account to perform online banking functions such as executing fund transfers or retrieving current account balances. The fourth column of table 440 identifies the accounts that the customer has with the financial institution (i.e., active accounts). For example, John Smith has five active accounts with Bank of America (savings, interest checking, home equity, credit card, and overdraft protection), one active account with Charles Schwab (money market account), and one active account with Rainbow Credit Union (savings account). The next column in table 440 indicates the current account balance for each active account. The last column indicates user preferences. The user preferences are determined by the user based on the manner in which the user wants information displayed, the manner in which accounts should be analyzed, and the types of

1 recommendations the user desires. Additionally, the user preferences may specify
2 certain minimum balances or other requirements for all accounts or for specific
3 accounts. For example, the user preferences for John Smith specify that a
4 minimum balance of \$1500 should be maintained in the interest checking account.
5 These user preferences are typically incorporated into the logic rules, discussed
6 above, which are used to determine when and how to adjust funds between
7 accounts.

8 Other types of user preferences include a maximum number of transactions
9 per month in a particular account (e.g., some money market accounts set limits on
10 the number of transactions in a particular month). By setting a user preference (or
11 a logic rule) to limit the number of monthly transactions, the financial
12 management system will not recommend (or attempt to execute) too many
13 transactions in a particular month. A user may also set a preference that requires
14 the financial management system to predict expenses for the next seven days (e.g.,
15 based on historical expenses during similar periods) and maintain a "buffer" in the
16 account equal to the predicted expenses for the next seven days. Further, a user
17 may set a preference indicating that funds should not be adjusted unless the
18 adjustment results in a savings of at least five dollars per day.

19 Figs. 14-15 illustrate exemplary user interface screens illustrating various
20 account entry fields and account recommendations. Fig. 14 illustrates an example
21 screen 500 generated by a web browser or other application that allows a user to
22 enter account information and preferences. Each entry identifies an institution 502
23 associated with the account and an account number 504. The user may select
24 whether the financial management system has access to move funds into the
25 account, out of the account, or both, by selecting the appropriate check boxes 506.

1 The user may also set a maximum amount that can be withdrawn from the account
2 at a particular time or during a particular time period by entering the amount in
3 field 508. The credit routing number for the account is entered in field 510 and
4 the debit routing number for the account is entered in field 512.

5 Although not shown in Fig. 14, other fields may be provided in the user
6 interface to allow the user to enter additional preferences or information, such as
7 interest rate, minimum balance the user wants maintained, etc. Certain account
8 information (such as interest rate and routing numbers) may be obtained from the
9 bank directly, thereby minimizing the information required to be entered by the
10 user.

11 Fig. 15 illustrates another example screen 550 generated by a web browser
12 or other application that allows a user to review recommendations generated by
13 the financial management system. In the example of Fig. 15, one recommendation
14 552 is shown – to transfer funds from the Wells Fargo Checking account into the
15 Chase Savings account. A recommended amount to transfer 554 has also been
16 identified. If the recommendation is executed, the projected savings 556 over the
17 next six months is \$26. The reasoning or analysis supporting the recommendation
18 and the projected savings is provided at 558. The user can execute the
19 recommendation by activating the “Execute” button 560 on the screen. After
20 activating the “Execute” button, the financial management system automatically
21 performs the necessary steps to transfer the recommended funds between the two
22 accounts.

23 In an alternate embodiment, the user is given the option to modify the
24 amount to be transferred between the two accounts. For example, the user may
25 only want to transfer \$500 instead of the recommended \$877. In this situation, the

1 financial management system is still able to automatically perform the steps
2 necessary to transfer \$500 between the two accounts.

3 The systems and procedures discussed perform various financial analysis
4 and generate one or more financial recommendations. To implement the financial
5 recommendations, such as transferring funds between accounts, one or more of the
6 systems and/or procedures discussed below may be utilized. Furthermore, the
7 systems and procedures discussed below can be used to transfer funds between
8 accounts at the user's request, and not necessarily based on any financial analysis
9 or financial recommendations. For example, the user may want to transfer funds
10 between two accounts in anticipation of a known withdrawal from the account
11 receiving the funds. Thus, the systems and procedures discussed below are useful
12 to transfer funds between accounts for any reason.

13 Fig. 16 illustrates an exemplary environment 570 in which funds are
14 transferred between various financial institutions using a payment network 572.
15 Payment network 572 can be, for example, an ACH network, a debit network, a
16 credit card network, or a wire transfer network. Three different financial
17 institutions 574, 576, and 578 are coupled to payment network 572, thereby
18 allowing the three financial institutions to exchange funds among one another. A
19 commercial payment processor 580 is coupled to financial institution 578 and a
20 financial management system 582. Financial management system 582 may be
21 similar to the financial management system 220, discussed above. Financial
22 management system 582 is typically a neutral third party that performs various
23 financial transactions on behalf of a user. Thus, financial management system 582
24 is not necessarily associated with any financial institution.
25

Financial management system 582 initiates the transfer of funds between financial institutions based on user instructions and/or recommendations based on analysis of the user's accounts. Additionally, financial management system 582 provides a common application or interface for accessing all accounts for a particular user. Thus, the user can access the financial management system 582 in a common manner and retrieve information and execute fund transfers using common commands, etc., regardless of the financial institutions involved. Furthermore, financial management system 582 registers multiple financial accounts for one or more account holders. Thus, financial management system 582 provides a single point for registering multiple financial accounts. A user may register multiple accounts associated with different financial institutions at this single point. After registering all accounts, the user can execute transactions between any of the registered accounts, regardless of whether the accounts are with the same or different financial institutions. Thus, the user is not required to establish account information for every pair of financial institutions that funds may be transferred between. Instead, the user registers the information associated with each account (e.g., account number, bank name, account password, etc.) once, which allows each registered account to exchange funds with any other registered account, regardless of the financial institutions associated with the accounts. The receiving and storing of the registered account information may be performed, for example, by financial management system 582.

Although only three financial institutions 574, 576, and 578 are shown in Fig. 18, a particular environment may include any number of financial institutions coupled to payment network 572. Furthermore, as discussed below, the financial

1 user's asset accounts and/or debt accounts as discussed above (or based on a user's
2 request to transfer funds between two accounts), the financial management system
3 generates a fund transfer instruction (block 590). The fund transfer instruction can
4 be divided into two separate transactions: a debit instruction (for the account from
5 which the funds are to be withdrawn) and a credit instruction (for the account to
6 which the funds are to be deposited). The debit instruction and the credit
7 instruction are communicated to a payment processor (block 592). The payment
8 processor initiates the requested debit and credit transactions through an
9 intermediate financial institution (e.g., financial institution 578 in Fig. 16) that is
10 coupled to the payment network (block 594). The debit transaction and/or the
11 credit transaction can be performed in real-time or deferred. The debit transaction
12 is received and executed by the appropriate financial institution (block 596) and
13 the credit transaction is received and executed by the appropriate financial
14 institution (block 598). If the financial management system has additional fund
15 transfers to execute (block 600), the procedure returns to block 590 to execute the
16 next transfer. The procedure terminates after executing all fund transfers.

17 For example, in the environment of Fig. 16, the financial management
18 system 582 receives user account information during a user registration process.
19 Next, the financial management system 582 analyzes the user's accounts and
20 determines whether funds should be transferred from the user's checking account
21 at financial institution 574 to the user's savings account at financial institution
22 576. To initiate this fund transfer, financial management system 582 generates a
23 debit instruction to withdraw the appropriate funds from the user's checking
24 account at financial institution 574. Additionally, financial management system
25 582 generates a credit instruction to deposit the appropriate funds (equal to the

1 funds withdrawn by the debit instruction) into the user's savings account at
2 financial institution 576. The instructions are then communicated via payment
3 processor 580 and financial institution 578 onto the payment network 572.

4 Alternatively, fund transfers can occur as one-time transfers initiated by the
5 user (e.g., transfer \$500 from the user's savings account to the user's checking
6 account) or as periodic transfers (e.g., transfer \$750 from the user's money market
7 account to the user's checking account on the 12th day of each month).
8 Additionally, fund transfers can occur based on one or more rules, such as transfer
9 \$600 from the user's savings account to the user's checking account if the
10 checking account balance falls below \$300.

11 Fig. 18 illustrates another exemplary environment 620 in which funds are
12 transferred between various financial institutions using multiple payment networks
13 626 and 628. In this example, a first financial institution 622 is coupled to
14 payment network 626 and a second financial institution 624 is coupled to payment
15 network 628. A third financial institution 630 is coupled to both payment
16 networks 626 and 628. A financial management system 632 is coupled to
17 financial institution 630. Financial management system 632 is similar to the
18 financial management system 220, discussed above.

19 If a fund transfer is required between accounts at the two financial
20 institutions 622 and 624, the financial management system 632 generates a fund
21 transfer instruction. The fund transfer instruction may include the account
22 information and financial institution information for the accounts involved, the
23 value to be transferred, and other information. In this example, the transfer
24 instruction is separated into two different transactions: a first transaction that
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1 withdraws the appropriate funds from an account at one financial institution and a
2 second transaction that deposits those funds into an account at the second financial
3 institution. Although two different transactions occur, the fund transfer appears as
4 a single transaction to the user or account holder.

5 The environment shown in Fig. 18 may be referred to as a “hub-and-spoke”
6 arrangement in which financial management system 632 is the “hub”, and
7 financial institutions 622 and 624 each represent a “spoke”. In alternate
8 embodiments, the environment in Fig. 18 can be expanded to include any number
9 of spokes coupled to any number of financial institutions via any number of
10 payment networks. This configuration allows financial management system 632
11 to control the execution of transactions between any of the financial institutions.

12 Fig. 19 illustrates another exemplary environment 650 in which funds can
13 be transferred between various financial institutions using a payment network 652.
14 In this example, a pair of financial institutions 654 and 656 are coupled to the
15 payment network 652. A financial management system 658 is also coupled to the
16 payment network 652 and a third financial institution 660. In this example, the
17 financial management system 658 is capable of executing certain transactions
18 directly on payment network 652, but requires a financial institution (or
19 commercial payment processor) to execute other transactions on payment network
20 652. Thus, financial institution 660 is utilized for those transactions that cannot be
21 executed directly by the financial management system 652.

22 Thus, a system and method has been described that analyzes multiple user
23 accounts to determine whether those accounts are optimized, or close to
24 optimized, and adjusts accounts based on this analysis or based on instructions
25

1 from the user. This system provides a single point of registration for a user to
2 register all financial accounts. The system also provides a common login process
3 and common log of transactions relating to all registered accounts.

4 Although the description above uses language that is specific to structural
5 features and/or methodological acts, it is to be understood that the invention
6 defined in the appended claims is not limited to the specific features or acts
7 described. Rather, the specific features and acts are disclosed as exemplary forms
8 of implementing the invention.

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